Environment and Green Audit

INVERTIS UNIVERSITY

INVERTIS VILLAGE, BAREILLY–LUCKNOW NATIONAL HIGHWAY,
NH-24, BAREILLY, UTTAR PRADESH - 243123

CONDUCTED BY :

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Executive Summary

A nation's growth starts from its educational institutions, where the ecology is thought as a prime factor of development associated with environment. A clean and healthy environment aids effective learning and provides a conducive learning environment. Educational institutions now a day are becoming more sensitive to environmental factors and more concepts are being introduced to make them eco-friendly. To preserve the environment within the campus, various viewpoints are applied by the several educational institutes to solve their environmental problems such as promotion of the energy savings, recycle of waste, water reduction, water harvesting etc. The activities pursued by university can also create a variety of adverse environmental impacts.

Environmental auditing is a process whereby an organisation's environmental performance is tested against its environmental policies and objectives.

Green audit is defined as an official examination of the effects a university has on the environment. As a part of such practice, internal environmental audit (Green Audit) is conducted to evaluate the actual scenario at the campus.

Green audit can be a useful tool for a university to determine how and where they are using the most energy or water or resources; the university can then consider how to implement changes and make savings. It can also be used to determine the type and volume of waste, which can be used for a recycling project or to improve waste minimization plan. Green auditing and the implementation of mitigation measures is a win-win situation for all the university, the learners and the planet. It can also create health consciousness and promote environmental awareness, values and ethics. It provides staff and students better understanding of Green impact on campus. Green auditing promote financial savings through reduction of resource use. It gives an opportunity for the development of ownership, personal and social responsibility for the students and teachers.

If self-enquiry is a natural and necessary outgrowth of a quality education, it could also be stated that institutional self enquiry is a natural and necessary outgrowth of a quality educational institution. Thus it is imperative that the university evaluate its own contributions toward a sustainable future. As environmental sustainability is becoming an increasingly

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important issue for the nation, the role of higher educational institutions in relation to environmental sustainability is more prevalent.

Introduction

In INVERTIS UNIVERSITY, Bareilly the audit process involved initial interviews with management to clarify policies, activities, records and the cooperation of staff and students in the implementation of mitigation measures.

This was followed by staff interviews, review of records, observation of practices and observable outcomes. In addition, the approach ensured that the management and staff are active participants in the green auditing process in the university.

The baseline data prepared for the INVERTIS UNIVERSITY, Bareilly will be a useful tool for campus greening, resource management, planning of future projects, and a document for implementation of sustainable development of the university. Existing data will allow the university to compare its programmes and operations with those of peer institutions, identify areas in need of improvement, and prioritize the implementation of future projects. We expect that the management will be committed to implement the green audit recommendations.

Water is a very precious commodity and merely by un-restricted drawing of water from bore wells and its very low subsidized tariff from municipal authority is a main impediment in water conservation in India.

Though, water is renewable and is replenished through water cycle but increasing population and industrial requirement are posing a very serious threat on availability of water for all on the Earth.

It is excellent that the management of INVERTIS UNIVERSITY, Bareilly and other staff has great respect for sustainable living and are always acting at the right time for remedial measures for protection of Environment and ultimately caring for Society by reduction of resource use.

The Mantra followed is REDUCE-REUSE AND RECYCLE.

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General Recommendations

- Display of Green Policy at following prominent locations inside the premises.
  a. Near main gate
  b. At main entrance of Administrative Building
  c. All Hostels/Mess
  d. Academic Blocks
  e. Auditorium
  f. Canteen/Cafeteria.
- Signage for Tobacco free campus be displayed at prominent locations in campus.
- Signage for Food wastage be displayed at important locations of Canteen/Messes and Cafeteria in campus.
- Signage for Water conservation be displayed at important locations in campus.
- Signage for plastic free campus
- Signage for Segregation of waste.
- Provision of different dust bins as a set at a common location.
- Stack Height of DG set exhaust is not as per CPCB requirement.
- Fume exhaust hoods are not provided in chemistry lab which is not proper. It should be discharged above building height. Presently fumes are dispersing around building affecting local environment.

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Environmental & Green Policy– Invertis University Bareilly

Policy Statement

The Invertis University, Bareilly is committed to managing its estates in accordance with responsibilities to the environment. These responsibilities shall be demonstrated within the following areas as a minimum:

1. **Tobacco Free premises**: The college administration pledges to make the premises totally tobacco free. No smoking or other type of tobacco products shall be allowed to inside the University campus.

2. **Purchasing:** In purchasing its services, materials, equipment and consumable items, the University will, where possible, purchase items produced in ways which do least environmental harm, which are not supplied with excessive packaging; which are benign or at least harmless in their effect on the environment. Where possible, preference will be given to local or regional suppliers to maximize the university input to the local community as well as reduction of environmental impact due to transportation.

3. **Cleaning**: The University shall use cleaning products based on environmental considerations as well as cost and suitability. It will monitor its working practices with a view to administering dosages so as to reduce the risk of over concentration and excess residue of unused cleaning mixtures finding their way into piped waste disposal systems.

4. **Waste Disposal and Recycling**: The University will seek to minimize its generation of waste by reduction of purchased materials where this does not compromise its primary functions, or by re-use of materials within or outside the university campus. Where reduction or re-use is not feasible, materials will be recycled wherever possible. University already has vermin composting pits in the backyard of ground.

5. **Energy**: The University is environmentally responsible for its use of energy, and will therefore consider the sources, type, origin and destination of energy input and output throughout the College. This will require careful monitoring of consumption, the elimination of excessive or unnecessary use, and an ongoing program of energy

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conservation. There is already renewable energy solar PV plants installed and in future also efforts shall be made to use renewable energy to the extent possible for mitigation of impact of energy use by university on environment.

6. **New Build and Building Refurbishment:** The College will ensure that whenever new construction or refurbishment, work is planned and executed in a manner which reflects environmentally-responsible approaches defined by the National Building Code-2016.

7. **Green Travel Plan**: The University actively promotes the use of public transport, walking and cycling. The College owns vehicle and requires staff where possible to use public transport when on College assignments. This plan is regularly reviewed. The travel of students shall also be encouraged through public transport.

8. **Food Policy** : The College, will ensure that decisions pertaining to the purchase of food, together with the use and disposal of plastic crockery/cutlery, should at all times include environmental implications as well as such factors as cost and nutritional value.

9. **Environmental Rules and Guidelines**: The College commit to ensure compliance to extant pollution control and other applicable environmental guidelines. University is already installing 700 plants every year and reporting to Divisional Forest Officer, Bareilly.

10. **Water Use**: The University intends to promote optimization of water use by avoidance of wastage.

11. **E-Waste:** University has already signed a MoU to dispose its E-Waste and committed toward it.

12. **The college also commits for Plastic free environment in college premises.**

13. **University has certification for ISO 9001: 2015 (Quality Management System), ISO/IEC 27001: 2013 (Information Security Management System) & ISO 14001:2015 (Environment Management System).**

The policy shall be reviewed annually or as per requirement.

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Description of Campus

There are following blocks constructed in campus

1. Admin office
2. M-Block
3. B-Tech building
4. Seminar building
5. Faculty quarter A
6. Faculty quarter B
7. Nilgiri hostel
8. Shivalik hostel
9. Himgiri hostel
10. Bhagirathi hostel main tank
11. Bhagirathi hostel
12. University building
13. Caffee

Pre-Audit meeting

A pre-audit meeting provided an opportunity to reinforce the scope and objectives of the audit and discussions were held on the practicalities associated with the audit. This meeting is an important prerequisite for the green audit because it is the first opportunity to meet the University concerned personnel for audit and deal with any concerns.

Management's Commitment

The Management of the university has shown the commitment towards the green auditing during the pre-audit meeting. They were ready to encourage all green activities. It was decided to promote all activities that are environment friendly. Awareness programs on the environment are regularly conducted, the management of the University was willing to formulate policies based on green auditing report.

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Scope and Goals of Green and Environment Auditing

A clean and healthy environment aids effective learning and provides a conducive learning environment. There are various efforts around the world to address environmental education issues. Green Audit is the most efficient and ecological way to manage environmental

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problems. It is a kind of professional care, which is the responsibility of each individual who are the part of economical, financial, social, environmental factor. It is necessary to conduct green audit in university campus because students become aware of the green audit, its advantages to save the planet and they become good citizen of our country. Thus, Green audit becomes necessary at the university level.

Benefits of the Green and Environment Auditing

- More efficient resource management
- To provide basis for improved sustainability
- Financial savings through a reduction in resource use
- Enhance the alertness for environmental guidelines and duties
- Development of ownership, personal and social responsibility for the University and its environment
- Enhancement of university profile
- To create a green campus
- To enable waste management through reduction of waste generation, solid- waste and water recycling
- To create plastic free campus and evolve health consciousness among the stakeholders
- Recognize the cost saving methods through waste minimizing and managing and monitoring of environmental and sustainable development
- Developing an environmental ethic and value systems in youngsters.
- Point out the prevailing and forthcoming complications
- Authenticate conformity with the implemented laws
- Empower the organizations to frame a better environmental performance
- Impart environmental education through systematic environmental management approach and Improving environmental standards
- Benchmarking for environmental protection initiatives

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- Green audit is a valuable tool in the management programs of the university.

Target Areas of Green and Environment Auditing

Green audit forms part of a resource management process. Although they are individual events, the real value of green audits is the fact that these are carried out at defined intervals, and their results can illustrate improvement or changeover time. Eco-campus concept mainly focuses on the efficient use of energy and water; minimize waste generation or pollution and also economic efficiency.

All these indicators are assessed in process of "Green Auditing of educational institute". Eco-campus focuses on the reduction of contribution to emissions, procure a cost effective and secure supply of energy, encourage and enhance energy use conservation, promotes personal action, reduce the institute's energy and water consumption, reduce wastes to landfill, and integrate environmental considerations into all contracts and services considered to have significant environmental impacts. Target areas included in this green auditing are water, energy, waste, green campus and carbon footprint.

Auditing for Energy Management

Energy cannot be seen, but we know it is there because we can see its effects in the forms of heat, light and power. This indicator addresses energy consumption, energy sources, energy monitoring, lighting, appliances, and vehicles. Energy use is clearly an important aspect of campus sustainability and thus requires no explanation for its inclusion in the assessment. An old incandescent bulb uses approximately 60W to 100W while an energy efficient light emitting diode (LED) uses only less than 10 W. Energy auditing deals with the conservation and methods to reduce its consumption related to environmental degradation. It is therefore essential that any environmentally responsible institution examine its energy use practices. **LED use also has a peculiar advantage towards environment that LED's are not using any mercury as the case of CFL's or Fluorescent tubes.**

There is an endeavour to check, manage and optimize energy use for mitigating the impact of university activities on Environment.

Also the university has taken a lead for producing green energy from Solar PV panels already installed 800 kWp.

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Auditing for Waste Management

The university has entered into a contract with agency for food waste management handling.

Pollution from waste is aesthetically unpleasing and results in large amounts of litter in our communities, which can cause health problems. Plastic bags and discarded ropes and strings can be very dangerous to birds and other animals.

This indicator addresses waste production and disposal, plastic waste, paper waste, food waste, and recycling. Solid waste can be divided into two categories:

General waste and hazardous waste

General wastes include what is usually thrown away in homes and schools such as garbage, paper, tins and glass bottles. Hazardous waste is waste that is likely to be a threat to health or the environment like cleaning chemicals and petrol. Unscientific landfills may contain harmful contaminants that leach into soil and water supplies, and produce greenhouse gases contributing to global climate change.

Furthermore, solid waste often includes wasted material resources that could otherwise be channelled into better service through recycling, repair, and reuse. Thus the minimization of solid waste is essential to a sustainable campus. The auditor diagnoses the prevailing waste disposal policies and suggests the best way to combat the problems. It is therefore essential that any environmentally responsible institution examine its waste processing practices.

E-Waste: The old computers are sold back to vendor which is again put to beneficial use by repairing and it is good sustainable practice. Material not reusable is re-cycled as per extant guidelines. Key Boards and mouse, which become un-serviceable are also disposed-off. It is required to be ensured that vendor dealing with E-waste is authorised to collect E-waste.

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Presently university has a MoU with E-Waste authorised vendors who can handle E-waste are being engaged for management of E-waste.

सत्यमेव जयते

INDIA NON JUDICIAL

Government of Uttar Pradesh

e-Stamp

S.K. HASAN SADAR ACC. NO. UP14335004

Certificate No.	:	IN-UP24761385235961T
Certificate Issued Date	:	04-Aug-2021 05:34 PM
Account Reference	:	NEWIMPACC (SV)/ up14335004/ BAREILLY SADAR/ UP-BLY
Unique Doc. Reference	:	SUBIN-UPUP14335004379062283659O7T
Purchased by	:	MS BRP INFOTECH PVT LTD
Description of Document	:	Article 5 Agreement or Memorandum of an agreement
Property Description	:	Not Applicable
Consideration Price (Rs.)	:	
First Party	:	INVERTIS UNIVERSITY BAREILLY
Second Party	:	MS BRP INFOTECH PVT LTD
Stamp Duty Paid By	:	MS BRP INFOTECH PVT LTD
Stamp Duty Amount(Rs.)	:	100 (One Hundred only)

.....Please write or type below this line.....

AGREEMENT FOR DISPOSAL OF E WASTE

This agreement is made on this day 5, August 2021 at (U.P).

Between

INVERTIS UNIVERSITY, Invertis Village, Delhi Lucknow Highway NH-24, Bareilly Uttar Pradesh – 243123.

And

M/s BRP INFOTECH PVT. LTD. F-394, Phase-I, Industrial Area, M.G Road, Hapur, Uttar Pradesh – 245101 GST No. 09AAFCB0143F1Z4 through its authorized signatory (hereinafter referred to as "Vendor").

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Hazardous Waste: Lead Acid Cell Batteries are returned to Vendors for re-cycling of lead and other constituents.

Fluorescent tubes are handed over to Junk dealer who in turn should send them to Local re-cycling units. Storage of Fluorescent tubes in university should be as per recommended practice.

Auditing for Green Campus Management

Unfortunately, biodiversity is facing serious threats from habitat loss, pollution, over consumption and invasive species. Species are disappearing at an alarming rate and each loss affects nature's delicate balance and our quality of life. Without this variability in the living world, ecological systems and functions would break down, with detrimental consequences for all forms of life, including human beings. Newly planted and existing trees decrease the amount of carbon dioxide in the atmosphere. Trees play an important ecological role within the urban environment, as well as support improved public health and provide aesthetic benefits to cities. In one year, a single mature tree will absorb up to 48 pounds of carbon dioxide from the atmosphere, and release it as oxygen. The amount of oxygen that a singletree produces is enough to provide one day's supply of oxygen for people. So while you are busy studying and working on earning those good grades, all the trees on campus are also working hard to make the air cleaner for us. Trees on our campus impact our mental health as well; studies have shown that trees greatly reduce stress, which a huge deal is considering many students are under some amount of stress.

E-Waste disposal

The record of use and handling of E-waste is maintained .While disposing/Auction or sale of E-waste credential of purchaser should be documented to ensure that vendor is authorised for collection and ensuring re cycling of E-waste as per extant guidelines.

- **Hazardous waste (toxic)-yes**

  For safe handling and management of hazardous waste in an environmentally sound manner, Govt. of India has notified the Hazardous Waste (Management & Handling) Rules, 1989, under the Environment (Protection) Act, 1986. However, these Rules were suppressed with re notification of the Hazardous Wastes (Management, Handling and Trans boundary Movement) Rules, 2008. Under the said Rules, hazardous waste has been

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defined as those wastes which by reason of any of its physical, chemical, reactive, toxic, flammable, explosive or corrosive characteristics causes danger or is likely to cause danger to health or environment, whether alone or when in contact with other wastes or substances, and shall include wastes as specified in Schedules of the Rules.

- Solid waste-yes-Extra waste removed through truck and disposed in municipal waste collection points
- Dry leaves-Yes-Used in university for making manure/compost
- Canteen waste-yes-Used for Compost in university
- Liquid waste-yes-Preserved and used in university
- Glass-Yes-sent for recycling.
- Unused equipment-yes-Returned to vendors through sale
- Plastic waste-Yes-Segregated and removed

Canteen Waste-Handling practice

There are signs provided in Mess and Cafeteria for avoiding food wastage and take food as per requirement and there should not be any food wastage. These signage are required to be provided in all area where food is served or consumed.

1. All Hostel Mess
2. Canteen
3. Cafeteria

Food Procurement And Disposal

1. Food is prepared in Canteen/Mess and any food waste that is generated is now planned to be filled in compost pits for preparation of natural manure.
2. A good effort has been made to maintain all waste data for food. Record for all other types of wastes is also required to be maintained for better management.
3. Effort should be made for reduction of onsite wastages.

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Consumer Level:

As per the present observed practice at consumer level in the society at large, often, the used lamps are collected by the kabari from the households and collectively handed over to the glass recyclers for the recovery of glass material.

This is all operative in a highly unorganized sector. It has, also, been observed that, the used lamps are thrown in the garbage bins and finally into the municipal garbage dumpsites, contaminating air, water and soil. Most of the used lamps are broken either at transit solid waste bins (provided by local civic authority) or broken during the transport to the final disposal site.

A portion of the mercury, in vapor form, is released into the air; whereas rest of the mercury is released onto the soil with further possibility of getting into the surface and/or ground water bodies through the leachate from soil.

User Awareness:

All the consumers, individual domestic consumers and bulk consumers (offices, institutions, large residential complexes, etc.) should get fully aware about the potential health impact of mercury-bearing lamps, through audio-visual media and the product leaflets. The precautions, to be taken while cleaning up the broken FLs should, also, be known to the consumers. As a part of such awareness programs, the consumers, even at individual level, are expected to participate actively with constructive suggestions and provide the feedback, for the overall success of mercury management in fluorescent lamp

Collection: The collection of used lamps may be done mainly by two ways: (i) Collection of used lamp (FLs) from bulk consumers may either be arranged by the management of above set-up (institutions, etc.) for direct disposal to LRU or by the LRU which may arrange to pick up used lamps from such collection sites through an identified collection agency. (ii) Collection of used lamps (FLs) from individual domestic consumer may be arranged by the LRU, either through kabaris (individuals appointed for the purpose by LRU) or an identified collection agency for door to door pickup. Transportation: (i) The Handler (e.g. Kabari or representative of LRU) of used FLs in transit should take care of selection of proper vehicle and carriage so as to minimize breakage of used FLs.

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(ii) There should not be any intermediate transfer of materials in the transit stage. The collected used FLs should be straight transported to the LRF for further processing. (iii) The Handler should be trained to take care of mercury spills, if any, that takes place en-route the journey to LRU.

Noise Pollution

1. **Sounds of Normal Conversations:**

   Sound Intensity: 40-60 dB

   Health Hazard: Sound less than 80 dB is safe for the ear.

2. **Sounds emanating from Tape recorders or an Orchestra:**

   Sound Intensity: 70 dB

   Health Hazard: It is safe for ear.

3. **Sounds of Heavy Traffic:**

   Sound Intensity: 90 dB

   Health Hazard: Constant exposure to sound greater than 80 dB causes temporary hearing loss and if they are not treated immediately, causes permanent impairment.

4. **Sounds of Pneumatic drills and other machines:**

   Sound Intensity: 100 dB

   Health Hazard: Constant exposure causes temporary hearing loss and if they are not treated immediately, causes permanent impairment.

5. **Sounds of Aircraft engine:**

   Sound Intensity: 100-200 dB

   Health Hazard: Higher noise level of 160 dB cause total deafness, rupturing eardrums, damaging inner ear. It also causes high blood pressure, ulcer in stomach, palpitation, nervous problems, irritation, anger, and affects pregnant women's embryo.

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6. Sounds of Rockets during Takeoff:

Sound Intensity: 200 dB

Health Hazard: It is dangerously causing total deafness by rupturing the eardrums and damaging the inner ear. It also causes high blood pressure, ulcer in stomach, palpitation, nervous problems, irritation, anger, and affects pregnant women's embryo.

Decibels Measurement –Invertis University

Sr.No.	Location	Decibel level Measurement	Remarks
1	Admin office	48	Satisfactory
2	M-Block	47	Satisfactory
3	B-Tech building	48	Satisfactory
4	Seminar building	49	Satisfactory
5	Faculty quarter A	46.5	Satisfactory
6	Faculty quarter B	48	Satisfactory
7	Nilgiri hostel	49.5	Satisfactory
8	Shivalik hostel	52.7	Satisfactory
9	Himgiri hostel	51.3	Satisfactory
10	Bhagirathi hostel main tank	51.0	Satisfactory
11	Bhagirathi hostel	50.5	Satisfactory
12	University building	47.2	Satisfactory

Sound/Decibel level measured is satisfactory and there is no adverse impact of the same on occupants.

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Custodial Chemical Use

Chemical for one year requirement are used in Labs and these are stored in a separate store. The store requires to be ventilated and hazard analysis should be got done through Material Specification Data Sheet and record should be maintained. Proper ventilation with hoods should be designed.

There is practice of burial of chemical waste in the soil in the university campus, This causes pollution of soil. The chemicals collected be disposed as per guidelines so that there is

Transportation Practices

Most of students are using shared transport, there is a university bus arranged to ferry students from nearest bus stand to university campus, which is sustainable. Students are using Buses, Shared auto. There are many buses owned by the university. The consumption of HSD by buses is monitored for optimised consumption.

Teaching and Non Teaching faculty is also sensitized for using pooled transportation for working towards sustainability and reducing resource use and encouragement of resource conservation.

Procurement Practices To Be Followed

Presently there is no practice to consider impact of procurement of different items on the Environment.

Procurement team is required to be made aware regarding procurement of goods and services that are sustainable. The sensitization is required for all purchases in a way that optimized utilisation of natural resources is possible.

1. Paper with Recycle content
2. AC's using refrigerant with Zero ODP Refrigerant
3. Environmental friendly Housekeeping Chemicals
4. Paints, Adhesives, sealants with recommended percentage of volatile organic compound.

Paper Use and Printing Goals

1. Efforts should be directed through use of E-Books for reducing the use of paper.
2. Students are encouraged to make use of E- Library.

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3. There are instructions to staff and student to resort to printing only if it is un-avoidable.

4. Papers should be purchased that have recycled content.

Recommended Paper use and Printing Goal to be followed. All concerned are required to be sensitized for adhering to these practices.

1. Distribute memos, reports, purchase orders and brochures electronically.
2. Encourage re-use of scrap paper for printing and note taking. Larger printers should have one dedicated tray for the reuse of scrap paper.
3. Print on letterhead paper only as needed; use electronic letterhead whenever possible
4. Network all printing to shared copiers/printers and eliminate stand-alone printers where possible
5. Discourage reckless printing and copying by requiring use of an account/password
6. Promote a 'Think before you Print' culture
7. Desktop drafting and editing of documents
8. Reduce default margin settings
9. Use toner-saving fonts (e.g. EcoFont) or smaller-sized fonts
10. Encourage increased use of Blackboard /Electronic Board as a paper-free resource
11. Training and Adherence - Distribute (an) email(s) with detailed instructions, including "screen shots" on how to change settings on computers, copiers, faxes, printers
12. Establish duplex (two-sided) copying and printing as standard
13. Phase out meeting handouts and distribute/project them electronically (this needs to be better defined).
14. Digitize forms and administrative and admission processes. Continue replacing paper based processes and administration.
15. Double-sided student assignments as standard (with electronic submission, grading & return)
16. Faxes: phase out fax machines, utilize computer faxing, end use of fax cover pages (research applicable technology/software: Win fax? E-fax?)
17. Increase electronic archiving and record keeping (this needs to be better defined and targets identified; work with Purchasing, Personnel, Academic Department and/or Student Records to be determined)

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E-Library

E-books v/s Traditional books data and year wise history to moving from traditional to E-system.

There is constant endeavour to promote use of E-Books, which is a very positive effort.

Despite fewer in numbers the e-books have advantage of being used by multiple students/ faculty simultaneously and thus creating better impact on sustainability in contrary to hard copy that can be read by only one person at a time.

The following recommendations are made

1. Use of E-books be promoted for students and faculty members specially in present Covid situation.
2. No. of E-books made available should be increased continuously.
3. Training on sustainability should be provided.
4. Adaption be promoted considering it to be a new normal.
5. Targets for increasing E-books should be fixed on continual basis.

Training and Awareness

The university is regularly conducting awareness program for students and faculty members.

Governance

Through enactment Waste Management and Green Initiative policy and its circulation to all stake holders, sustainability can be achieved. The results are regularly required to be verified at Periodical intervals. These can be managed through internal or external audits.

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Plantation at Invertis University, Bareilly

Plantation Inventory

There is regular plantation program in vogue. University is planting 700 trees yearly from last three years and reporting to divisional forest officer.

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Ref No IU/RE-1/2021 Date

To,
The DFO,
Bareilly.

Subject: Regarding plantation status and digging of pits at Invertis University, Bareilly

Dear Sir,

Kindly find the report regarding digging of pits and plants required at Invertis University,
Bareilly to meet the guidelines of the Government.

We have a target of 700 plants for this year and we have already planted some saplings and prepared 190 pits for plantation. Therefore, you are requested to provide 300 saplings for plantation to achieve our assigned target.

Thanking you, with regards.

Santosh 23/06/2021

Santosh Kumar
Associate Professor
Registrar
Invertis University, Bareilly
Contact No.09690017906

Cc to : Higher Education officer, Bareilly

Received
23/6/21

Invertis Village, Bareilly-Lucknow National Highway-24, Bareilly (UP)-243 123
• Ph. & Telefax: (0581) 2460442 2460443, 3390000
• Fax: (0581) 3390233, 2460454 • Email: info@invertis.org

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Air Quality

CPCB GUIDELINES

Exhaust of DG Set is required to be raised as per CPCB requirement.
There is no record of air quality testing done earlier. Generally, the dust level is found normal since university is located outside the town .

As per WHO guidelines the following should be the limits for Air Quality

Particulate matter

Guidelines	
$PM_{2.5}$:	10 µg/m³ annual mean 25 µg/m³ 24-hour mean
PM_{10}:	20 µg/m³ annual mean 50 µg/m³ 24-hour mean

Air Quality Measurement

Sr. no	Location	PM-2.5	PM-10	Particles	CO-2	HCHO	Remarks
1	Admin office	60.1	88.3	6940	851	2.245	Higher HCHO-Formaldehyde-Slightly Higher PM
2	M-Block	59.4	89.8	7092	1023	0.147	Slightly Higher PM
3	B-Tech building	54.5	82.7	6872	745	0.027	Slightly Higher PM
4	Seminar building	57.4	87.6	6417	752	0.021	Slightly Higher PM
5	Faculty quarter A	57.1	88.8	6245	761	0.001	Slightly Higher PM
6	Faculty quarter B	55.5	82.3	6718	755	0.018	Slightly Higher PM
7	Nilgiri hostel	28	45.5	2828	666	0.02	Slightly Higher PM
8	Shivalik hostel	22.9	38.2	2849	779	0.077	Slightly Higher PM
9	Himgiri hostel	24.9	36.8	2953	780	0.45	Slightly Higher PM
10	Bhagirathi hostel main tank	70.2	102.3	7744	790	0.028	Slightly Higher PM
11	Bhagirathi hostel	60.3	90.7	7422	810	0.005	Slightly Higher PM
12	University building	70.2	102.3	7744	790	0.028	Slightly Higher PM

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The values of PM-2.5 and PM-10 are slightly high and limits are dangerous for human beings. Values of CO2 and Formaldehyde are generally satisfactory except for Admn. area. There is not much that can be done by University for management of particulate matter. Only any loose soil or construction material inside premises should be sprinkled with water to mitigate to some extent.

Significance of Refrigerant for Environment

Table depicting properties of Refrigerants

Refrigerant	Global Warming Poetential	Ozone Depletion Potential
R 22	1810	Medium
R 410A	2088	Nil
R 32	675	Nil
R 134A	1430	Nil
R 290	3	Nil
R 600A	3	Nil

Refrigerant	Type	ODP	GWP	Atmospheric lifetime (years)
R12	CFC	0.9	8500	102
R22	HCFC	0.06	1700	13.3
R134a	HFC	0	1300	14
R407C	HFC blend	0	1610	36
R410A	HFC blend	0	1900	36
Ammonia (R717)	Natural compound	0	0	< 1
Propane (R290)	HC	0	3	< 1
R1234yf	HFC unsat.	0	6	Very low
R1234ze	HFC unsat.	0	6	Very low

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Detail of Refrigerant used in installed Air Conditioners

Data of Refrigerants not maintained. It is recommended that in future all procurement for AC's, Water cooler etc. be made with consideration for Environment friendly refrigerants.

Recommendations

1. It is recommended that in future care should be taken to purchase Air conditioners with refrigerants for which GWP is low and ODP is nil.
2. Life cycle cost should be considered for making decision about purchase of Air Conditioners.
3. All AC's that were procured more than 8 years ago should be replaced with best in class energy efficient Air Conditioners after taking into consideration Life Cycle Cost. This will eliminate existing AC's impact on environment through low impact refrigerant and also with low consumption of Electricity thus reducing

ECO Friendly House Keeping Materials

Presently chemicals not complying to Green Pro certification are used. It is recommended that in future housekeeping chemicals with Green Pro standard certification be only used.

It is recommended that Eco Friendly material and Sustainable material as per NBC-2016 guidelines to be procured and used.

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CII
Confederation of Indian Industry

GreenPro

GreenPro Certification Standard for

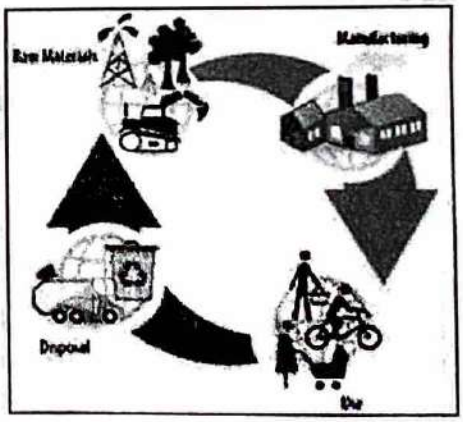
Cleaning Chemicals

Version 1.0

GreenPro Certification – Life Cycle Approach

The Green Products Rating adopts a holistic approach based on the 'Life Cycle' of the product. The rating system encourages the product manufacturers to implement measures that would result in environmental, health and wellbeing benefits at the following stages of the life cycle of the products.

1. Product Design
2. Raw materials
3. Manufacturing Process
4. Product Performance during use
5. Disposal / Recycling



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For Users

Use of rated Green products leads to significant tangible and intangible benefits for the end users.

Some of the benefits for the users are highlighted as below:

1. Time and effort in carrying out due diligence in selecting a green product is saved
2. The user is assured of the performance of the product and equipment
3. Ensures Toxic and hazardous substances free products which in turn decrease "health and wellbeing" risks of the users
4. Improved product performance during use to reduce resource consumption and environmental impacts
5. Recognition and credits for achieving national and international Certification for the buildings

National Priorities addressed in Certification

GreenPro Certification addresses the following which are priorities of the Government at the National level:

Water:

Water is a major concern in most part of the country. Implementation of water efficiency measures and "zero Liquid Discharge" are being encouraged to address the water related issues.

Land:

Availability of land and increase in land pollution are major areas of concern. The Certification system demands for increased recycling of material after use which would result in reduction in landfills and hence reduction in land pollution.

Energy Efficiency:

The Certification system encourages the product manufacturers to adopt energy efficiency improvement measures and reduce their energy consumption which is in line with the National Mission on Enhanced Energy Efficiency. This also addresses

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The key objective of the council is to facilitate Green product market transformation in India through 'Green Product Certification'.

The initial focus of the council will be on Green building products and related technologies. Over a period of time, the council will expand its focus to other areas such as Industrial products, consumer items, services etc.

Why GreenPro Certification?

The GreenPro Certification is a tool for facilitating Green Product market transformation in the country. The GreenPro Certification is expected to:

1. Enable green building projects in selecting the right product and equipment
2. Increase the market demand for the Green products
3. Put a system in place for a product to be called 'green'

Eliminate exposure to prohibited substances that can lead to long term health effects either through respiration / direct contact.

Mandatory Requirement Manufacturer to provide Material Safety Data Sheet (MSDS) for the products. The MSDS should have the following details:

1. Chemical Identify
2. Manufacturer's information
3. Hazardous ingredients / Identify information
4. Physical, Chemical characteristics
5. Fire and explosion hazard data
6. Reactivity data
7. Health hazard data
8. Precautions of safe handling and use
9. Control measures
10. Emergency and first aid procedures

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General Purpose Cleaners

Presently there is no practice for procurement of Eco Friendly chemical.

Eco friendly housekeeping materials are recommended to be used for all cleaning application should be Green Pro or any similar Indian standard should be procured in future and records of such procurement b documented for future references.

The cleaning material may be required for following applications and also may be some other in addition to these.

1. Glass Cleaners
2. Bathroom Cleaners
3. Disinfectants and Sanitizers
4. Cleaner/Degreasers
5. Carpet and Upholstery Cleaners
6. Floor Cleaners
7. Liquid Hand Soap
8. Furniture Polish

Ventilation Assessment

There is no area which is not Air-conditioned. Mechanical ventilation has since been provided.

Fire Safety:

No halon based fire extinguishers have been used, it is very good initiative. As a future guideline It is recommended that of fire suppression system is to be used for any fire extinguishing system, only clean agents with minimum environmental impact should be installed.

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Sustainable Development Goals

Sustainable development should always be practiced in all activities of university.

Consideration for New Constructions

There are no construction presently going on and is also not mooted in near future.

There should be an effort to Encourage use of local materials

Always encourage use of locally available material. With this we will help local population and their Social Development Index will get a boost. Also low energy shall be expanded on transportation that will ultimately save fossil fuels and make decision of an organization more sustainable.

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Low VOC (Volatile Organic Compound)%

The following material contains VOC

1. Paints
2. Adhesives
3. Sealants
4. Other materials

It should be ensured that while procurement or issuing PO's for work it should be ensured that only material with permitted percentage of VOC are procured or used in of works awarded. Special conditions in contract/specifications shall be incorporated.

Team responsible for PMC shall ensure that material brought to site and used in execution of work is in compliance to Green specifications.

Use of Low Impact material and Zero ODP material

Where ever relevant and applicable care should be taken to include in specifications use of low impact material and only zero ODP material shall be procured or used in execution of works by contractors/Vendors.

Guidelines for Environment Friendly and Green Initiatives

VOC limits of materials

Type of Material	VOC Limit (g/L less water)
Paints	
Non- Flat (Glossy) paint	150
Flat (Mat) paint	50
Anti- corrosive/ anti-rust paints	250
Varnish	350
Adhesives	
Glazing adhesives	100
Tiles adhesives	65
Wood adhesive	30
Wood flooring adhesive	100

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Minimum Ventilation Rates in Various Functional Zones*

Occupancy Category	People Outdoor Air Rate	Area Outdoor Air Rate
	Cfm/person	Cfm/ sq.ft
Correctional Facilities		
Dayroom, Guard station	5	0.06
Booking/ waiting	7.5	0.06
Education Facilities		
Daycare (through age 4), daycare sickroom, Art Classroom, science laboratories, college laboratories, wood, metal shop	10	0.18
Classrooms (ages 5-8), (age 9+), computer lab, media centre	10	0.12
Lecture Room/ hall (fixed seating)	7.5	0.06
Music/ theater/ dance,	10	0.06
Multi use assembly	7.5	0.06
Food & Beverages Services		
Restaurant dining rooms/ cafeteria/ fast food dining/ Bars/ Cocktail Lounges	7.5	0.18
General		
Break Rooms, Coffee stations, conference/ meeting	5	0.06
Corridors	-	0.06
Storage Rooms	-	0.12
Hotels, Motels, Resorts, Dormitories		
Bedroom/ living room, barracks sleeping areas	5	0.06
laundry rooms	5	0.12
Lobbies/ prefunction	7.5	0.06
Multipurpose assembly	5	0.06

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Occupancy Category	People Outdoor Air Rate	Area Outdoor Air Rate
	Cfm/person	Cfm/ sq.ft
Office Building		
Office Spaces, Reception Areas, Telephone, data entry, Main entry Lobbies	5	0.06
Electrical Equipment rooms	-	0.06
Elevator machine rooms	-	0.12
Pharmacy (prep area)	5	0.18
Photo Studios	5	0.12
Shipping/ receiving	-	0.12
Telephone closets	-	0.00
Transportation waiting	7.5	0.06
Warehouses	-	0.06
Public Assembly Spaces		
Auditorium seating area, Place of religious worship, Courtrooms, Legislative Chambers, Lobbies	5	0.06
Libraries	5	0.12
Museums (children's)	7.5	0.06
Museum/ galleries	7.5	0.06
Retail		
Sales	7.5	0.12
Mall common Areas	7.5	0.06
Barber Shop	7.5	0.06
Beauty & nail salons	20	0.12
Pet Shops (animal areas)	7.5	0.18
Super Market, Coin operated Laundries	7.5	0.06

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Occupancy Category	People Outdoor Air Rate	Area Outdoor Air Rate
	Cfm/person	Cfm/ sq.ft
Sports & Entertainment		
Sports arena (Play Area), Gym, stadium (play area)	-	0.30
Spectator area	7.5	0.06
Swimming (pool & deck)	-	0.48
Disco/dance floor/ health club/ aerobics room/ weight rooms	20	0.06
Bowling alley (seating)	10	0.12
Gambling casinos/ game arcades	7.5	0.18
Stages, studios	10	0.06

* *Total outdoor air flow in functional zone =*

$$\left\{\begin{array}{c}\text{Outdoor air flow rate required per person as per the above table}\\ \times\\ \text{Zone population}\end{array}\right\} + \left\{\begin{array}{c}\text{Outdoor air flow rate required per unit area as per the above table}\\ \times\\ \text{Net occupiable zone area}\end{array}\right\}$$

Landscape Water Demand Reduction

Plant factor for various species

Plant species	Plant factor
Lawns	1
Native grass	0.45
Existing native trees	0
Newly planted native shrubs	0.3
Newly planted exotic shrubs	0.9
Newly planted native trees	0.15
Newly planted exotic trees	1.65

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Plant species	Plant factor
Vertical gardens	0.35
Newly planted native shrubs on podium	1.3
Newly planted exotic shrubs on podium	1.9
Newly planted native trees on podium	1.15
Newly planted exotic trees on podium	2.65

Note: For potted plants, calculate the water requirement as volume of pot and divide it by 4.

Table 2 Irrigation system efficiency

Type of irrigation system	Efficiency (%)
Flood	65
Furrow	80
Sprinkler	85
Drip	90

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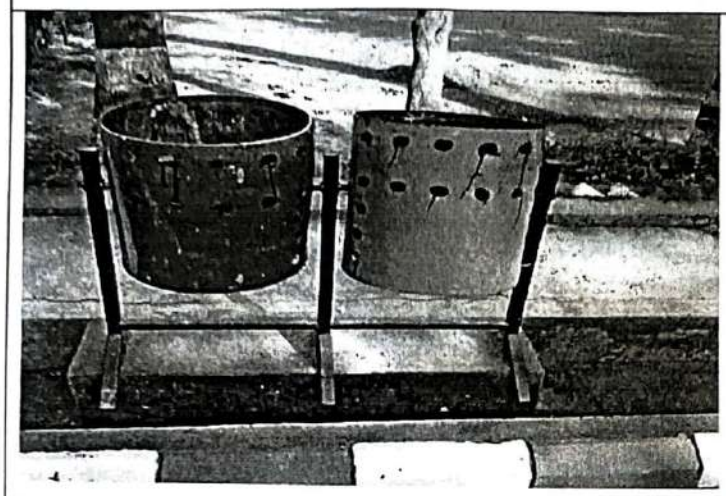
Photographs-Environmental Concerns

Photographs Depicting Issues Related To Green And Environment Audit Invertis University, Bareilly	
	Two type of Bins have been provided for segregation of waste at source bins as shown in next photograph should be provided.
	PREFERRED BINS-Onsite segregation of waste is not presently practiced. These type of bins should be provided at all locations.

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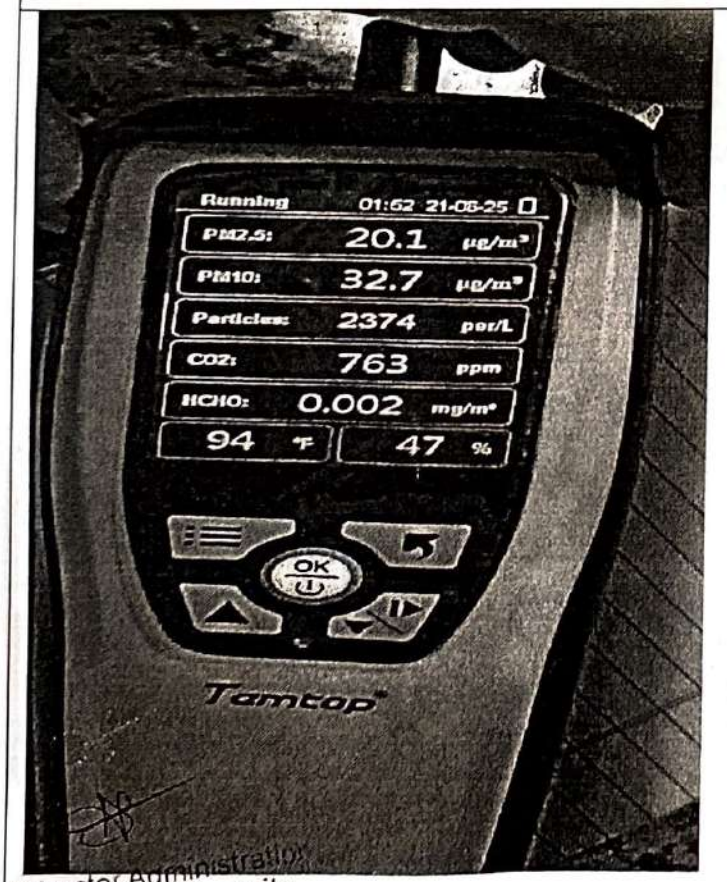
	Stack of DG sets are not as per requirement of CPCB Guidelines. These are required to be taken above height of building and stack height should be as following formula Ht. of Stack = Ht of Building+ 0.2 * sq. root of kVA of DG set
	Environment Parameters measurement-PM2.5, PM-10, CO2 and Formaldehyde and Total Particulate matter

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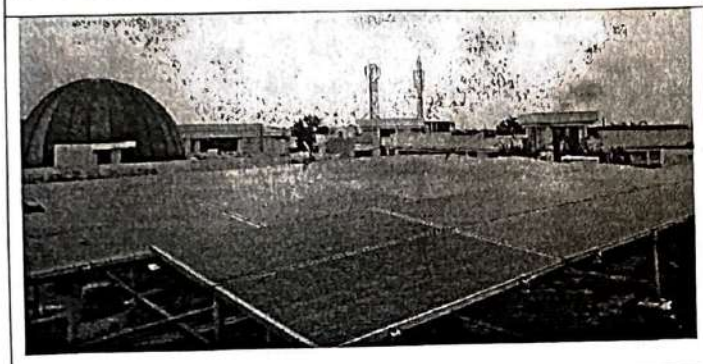
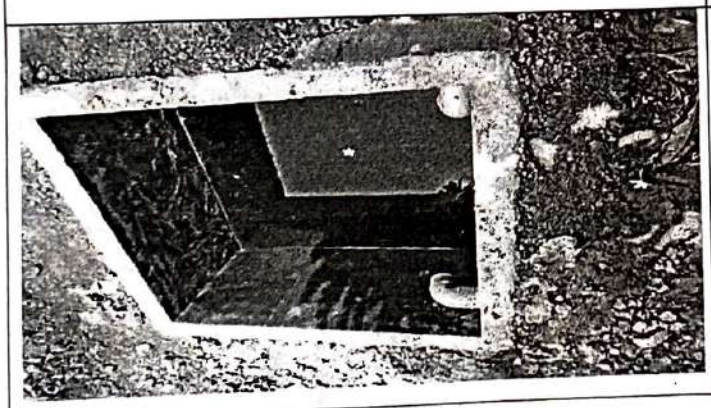
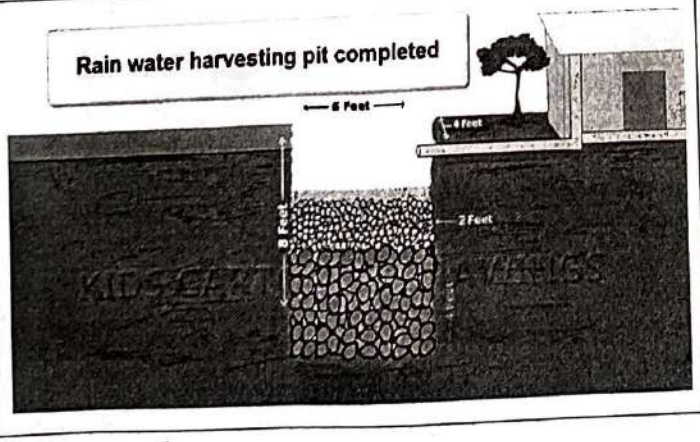
	Exhaust hoods of Labs not provided for chemistry Lab fumes. The fume hood is required to be provided raised to level above building. The final exhaust should be raised above building for proper dispersion of fumes.
	Cool roof may be provided with covering at roof level for exposed roof with broken china mosaic tiles. The Air conditioning energy for the top floor shall be reduced to the extent of 15 %
	Rain water harvesting pit is installed to collect water instead of charging ground water.
	These type of pits should be provided in the premises all locations.

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Annexures

ISO 9001: 2015 (Quality Management System)

Certificate

Otabu

Certificate of Registration

This is to certify that

INVERTIS UNIVERSITY

INVERTIS VILLAGE, BAREILLY - LUCKNOW NATIONAL HIGHWAY - 24,
BAREILLY UTTAR PRADESH - 243123, INDIA

has been assessed and certified by Otabu Certification Limited
as meeting the requirements of

ISO 9001:2015
Quality Management System

For the following activities

POST GRADUATE AND UNDERGRADUATE PROGRAMS - MANAGEMENT, LAW, COMMERCE, COMPUTER APPLICATION, PHARMACY, EDUCATION, JOURNALISM, MASS COMMUNICATION, BIO SCIENCE TECHNOLOGY SCIENCE, FASHION DESIGN, ENGINEERING TECHNOLOGY AND AGRICULTURE

Date of Registration	: 10 September 2020
1st Surveillance Due	: 09 September 2021
2nd Surveillance Due	: 09 September 2022
Certificate Expiry (subject to the company maintaining its system to the required standard)	: 09 September 2023

Certificate No:- 200910607

To Verify this certificate please visit at www.otabucert.co.uk

OTABU CERTIFICATION LIMITED (UK)

SCOTLAND ACCREDITATION FORUM SAF

Authorised Signatory

Otabu Certification Limited (UK)

Validity of this Certificate is subject to Annual Surveillance audits done successfully

This Certificate of Registration remains the Property of Otabu Certification Limited and shall be returned immediately upon request.

Email:- info@otabucert.co.uk Website:- www.otabucert.co.uk

Suite 48, 88-90 Hatton Garden, London, ECIN 8PN, UK

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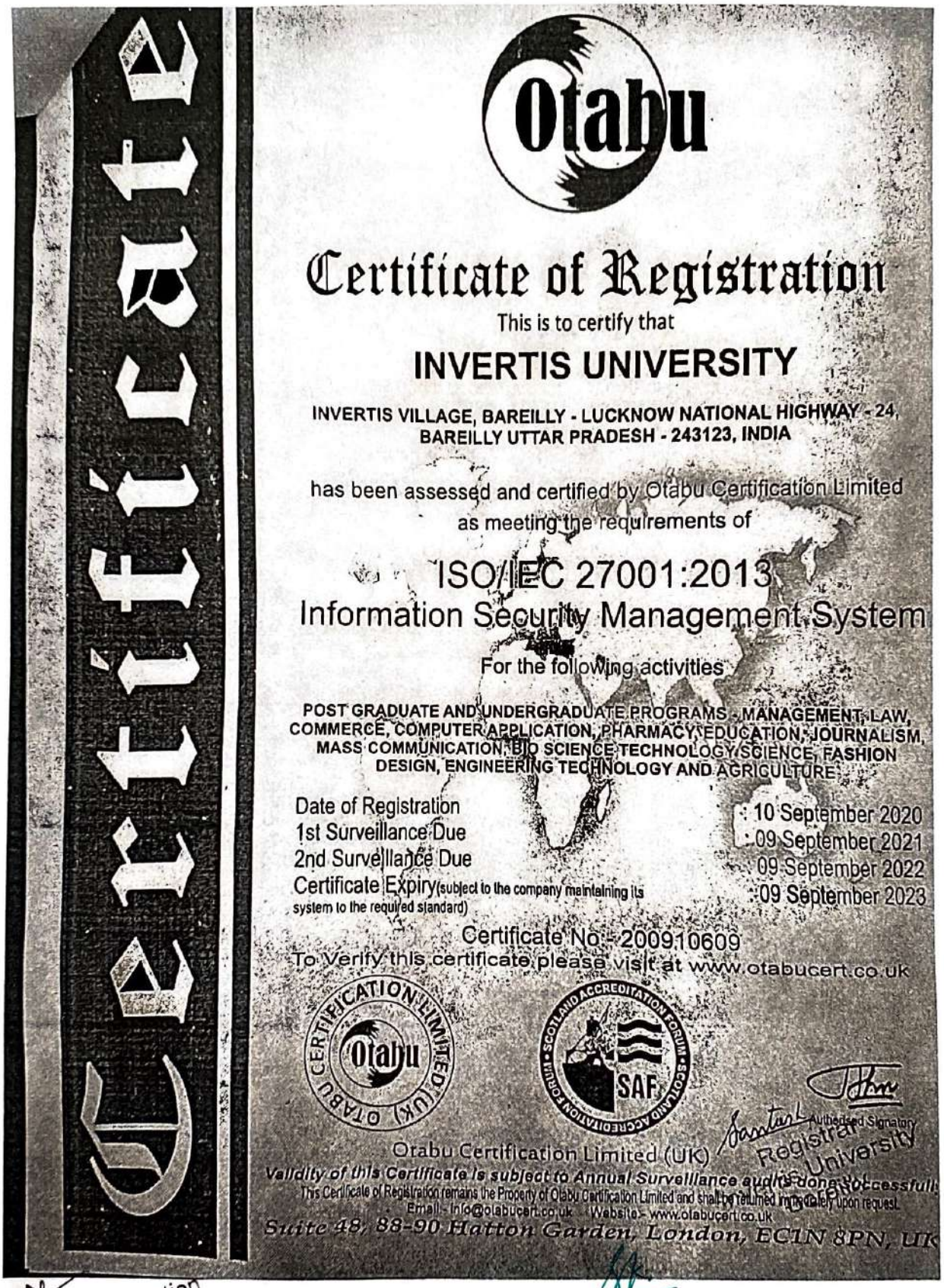
ISO/IEC 27001: 2013 (Information Security Management System)



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ISO 14001:2015 (Environment Management System).

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